

Foodplants and search strategy for the Bordered Gothic *Heliophobus reticulata* (Goeze)

The larval foodplants of the endangered Bordered Gothic moth *Heliophobus reticulata* appear to be unknown in the wild in the British Isles, according to the standard textbooks. In the late nineteenth century, Buckler tried rearing the larvae on Campions *Silene* spp., on the basis that in continental Europe the larva was reported to feed on *Silene*, *Saponaria* and *Dianthus*, preferring the seed capsules, but he was unsuccessful (see Barrett, *Lepidoptera of the British Islands* 4: 153). Newman & Leeds (1913. *Textbook of British butterflies and moths*) list Bladder Campion *Silene vulgaris* and Catchfly *Silene* spp. as the foodplants, but note that the larvae are difficult to rear. In the 1950s, the issue was explored again by Johnson (1953. *Ent. Rec.* 65: 326-327) and Lees (1954. *Ent. Rec.* 66: 4-5). Johnson tried rearing from eggs laid by a wild-caught female and was clearly uncertain of the foodplants. He offered the larvae "a salad of plants including several species of *Polygonum*, *Runex*, *Trifolium*, *Lotus*, *Lychnis* and *Silene*", finding that "most species of *Polygonum* were nibbled, and the flowers of *Lotus corniculatus* were eaten, the rest were ignored." All the larvae died quickly except one. The survivor reached a length of 2cm eating flowers and sometimes leaves of Knotgrass *Polygonum aviculare* but became flaccid and died about six weeks after hatching. As editor of the *Ent. Rec.* at the time, Cockayne added a footnote asking if any readers had reared the species and he had also contacted Austin Richardson who had found larvae in Ireland. He included Richardson's reply in his note, the details of which are that Richardson had found two unfamiliar fully-grown larvae in the soil under Sea Campion *S. maritima* near Waterville, Co. Kerry, in early September 1936, while digging for larvae of Barrett's Marbled Coronet *Hadena andalusica barrettii*. The two larvae pupated almost immediately and the following year two adults of the rosy local form emerged. Lees provided his account in reply to Cockayne's appeal, reporting in some detail how in 1930-1931 he managed to rear ten adults from the egg stage, principally on Knotgrass, but some Bladder Campion had been offered to the larvae at the start of their development. The female which laid the eggs had been captured in mid June 1931 at Little Aston, south Staffordshire and the progeny emerged between 25 June and 7 July 1931.

One purpose of the present note is to enter into the entomological literature an observation recently made by Mick Beeson, who has helped me search for the Bordered Gothic around Peterborough (*Ent. Rec.* 116: 131-133) and also helped me to rear larvae from Italy. Mick has found relevant information in Steers, J. A., 1960. *Scolt Head Island* Heffer, Cambridge, originally published in 1934. In Chapter 16, which was written by E.A. Ellis, but with input from F. Sowels and P. Brodie, we find "Other interesting moths.... are the Sand Dart feeding on Hound's-tongue and Prickly Saltwort, the Dog's Tooth on docks and Chenopodiaceae, the Bordered Gothic on Sea Campion and the White Colon on Orache." This suggests wild larvae had been found on Scolt Head Island and reared by one of the above gentlemen.

Soapwort *Saponaria officinalis* is another species with which the Bordered Gothic has been associated, indeed it was once named after it, *H. saponariae* Borkhausen, 1792, presumably after a larva had been found and reared on the plant. Julian Clarke (pers. comm.) has said that a captive female he once had would only lay eggs on this plant, of those species he offered. Soapwort has a scattered British distribution somewhat similar to the past records of the Bordered Gothic (Perring and Walters, 1990. *BSBI Atlas of the British Flora*), but it is a localised and infrequent plant, usually occurring in a few discreet stands in any district and is not easy to overlook. In many places where the adult moth has been reported, there is no Soapwort, nor any record that it was formerly present, so the moth cannot be exclusively dependent on this plant. For example, Barnhamcross Common, near Thetford, on the Norfolk/Suffolk boundary, is one of the last places in Britain to have produced annual records of the moth. Adults were being recorded there at light-traps up to about 1998 (S. Dudley, *Atropos* **20**: 59) yet when a BENHS field meeting was held there on 1 July 2004 to run light-traps in the hope of locating the moth, we found no Soapwort, but a fair amount of Bladder Campion *Silene vulgaris*, by which we placed our traps without success. This area has also been well-worked for moths on dates appropriate for the Bordered Gothic in the other years since 2000 by Tony Prichard and others (pers. comm.) without success.

Soapwort, like *Silene* and *Dianthus*, is a member of the Caryophyllaceae. In 2004, I was fortunate to attend the first Field Congress of the Societas Europaea Lepidopterologica (SEL) at the town of Burgeis, in the Sesvenna Valley, in the Italian Tyrol, 6-11 July 2004. On each night of the Congress I and others captured numbers of the Bordered Gothic at light in Burgeis and the environs, flying alongside *H. kitti*, some arriving just after dusk (see *Bull. AES* **64**: 104-117). I came back to the UK with eggs and egg-laying females, from which larvae were subsequently reared to final instar (see *British Wildlife* **16**: 58-60). This SEL Field Congress was invaluable in demonstrating a habitat and climate regime in which the Bordered Gothic was widespread and numerous, in the apparent absence of Soapwort. What was noted during the field excursions was that other members of the Caryophyllaceae were frequent in some areas where we were trapping the moth, particularly Bladder Campion, Red Campion *S. dioica* and pinks *Dianthus* spp. Rearing the larvae showed that they were able to grow from egg to fully-fed final instar larvae on Soapwort but that they would accept White Campion *Silene latifolia*. In both cases the flowering parts and especially the developing seed-capsules were strongly preferred over the foliage. I noted that all the larval instars are green except the last, which is brown, and that as the larvae grow and reach this stage they leave the foodplant by day and hide in earth or amongst paper and other litter in their boxes, as was noted by Lees. Lazlo Ronkay (pers. comm.) confirmed at the SEL Congress that the early instars can be found by day on larval foodplants such as *Silene* and *Dianthus* in the wild in central Europe. Unfortunately, when my captive fully grown larvae were in the care of Mick Beeson, who provided them with a peat-based mixture in which to pupate, they began to become flaccid and die and rapidly the whole stock was lost, as had

happened to most of those reared by Lees. We thought that the peat mixture may have been chemically treated with pesticides, but in view of the difficulties experienced by the above authors in rearing the species, the losses may have been only coincidental with the provision of peat and were more probably caused by a virus or other pathogen.

In conclusion, the larva of the Bordered Gothic appears to have been found in the wild in the British Isles pupating under Sea Campion in Co. Kerry in early September 1936 and feeding on it on Scolt Head Island, Norfolk, at some time prior to 1960. Although Soapwort has sufficient potential to justify targeted searches for the larva, such as those made unsuccessfully by David Agassiz and Roger Kiddie in north Kent in 2002 (Agassiz, unpublished report to Butterfly Conservation, 2002) and I around Peterborough from 2001-2003, campions such as Bladder Campion are at least as likely to support any surviving populations of the moth. I have not researched the current status of the moth in southern Ireland but since the start of the new millennium there is nowhere in Great Britain where a population of the moth has been confirmed. The most promising option is the Gravesend area of north Kent where singletons were recorded at light on 27 May and 20 June 2001 in David Agassiz's garden, where they had also been trapped on 10 & 24 June 1995, 8 June 1996 and 22 July 1998, with no trapping in 1999-2000 because David was overseas. However, the above survey in 2002 was unable to locate a local breeding site or place where the adults could be trapped reliably, though this might still exist. My own observations in Italy in 2004 and those of others in Britain in the twentieth century, indicate that the adult Bordered Gothic comes well to light, from soon after dusk, when populations are strong. Should any more singletons be trapped anywhere from 2006 onwards, I would recommend a search for the nearest campions as well as Soapwort and several additional nights of light-trapping in this area as quickly as possible, followed by searches for the young larvae by day on the plants from mid June to early July and for the larger larvae by night in the following weeks until the end of August. For more on the national decline of the Bordered Gothic see *Atropos* **16**: 76-77.— PAUL WARING, Reader, Centre for Environment & Rural Affairs, Writtle College, Essex. Address for correspondence: 1366 Lincoln Road, Werrington, Peterborough PE4 6LS.
